

SUMMARY OF GEOTECHNICAL CONDITIONS

Subsurface Conditions

From the existing ground surface, there is 15 to 25 feet of loose to medium dense silty sand and silt with sand. The silty sand and silt with sand is predominantly brown in color, drier at the ground surface, and becoming moist at depth. Underlying the looser surficial deposits are dense to very dense granular deposits comprised principally of silty sand, poorly graded sand, and layers of well graded gravel with sand. Cobbles were encountered during the field explorations within these denser granular deposits. The moisture in these deposits varies from moist to wet. These denser deposits vary in thickness from 15 feet to about 35 feet and are underlain by strong basalt bedrock. The basalt is fine-grained with closely spaced discontinuities. The basalt was encountered at an approximate elevation of 321 feet to 330 feet. The basalt that was encountered is strong and intact with an RQD ranging from 58% to 95%. The quality of the basalt generally increases with depth. Boring logs H-1-05 to H-4-05 describe the subsurface conditions in more detail.

Groundwater elevations were determined at the time of drilling and are expected to fluctuate with seasonal precipitation. At the time of drilling, groundwater was encountered at the following elevations:

H-1-05 El. 333 ft, Mar-05

H-2-05 El. 343 ft, Apr-05

H-3-05 El. 342 ft, Mar-05

H-4-05 El. 356 ft, Mar-05

Constructability Concerns

Due to staging, shoring or temporary slopes will be necessary during the construction of spread footings at the abutments. Sheet pile shoring systems will be difficult to construct and may not be feasible due to the presence of very dense materials containing gravel and cobbles. Should soldier piles be selected for shoring, the near surface loose granular deposits may be prone to caving, and may require flatter slopes should open excavation be used. Temporary casing may be required to maintain sidewall stability in the loose to medium dense near surface soils or in newly placed fill. The deeper dense to very dense granular soils may be prone to caving, as groundwater is present and the denser soils at depth are relatively clean. Depending on the depth of soldier piles, slurry or casing may be required to prevent ground loss. Casing installation may be difficult due to the dense soil conditions and cobbles.

At Pier 1, we expect to find medium dense to dense silty sand at the bottom elevation of the over excavation. However, the contractor should be prepared to excavate in dense to very dense materials with possible cobbles and boulders. The maximum elevation of the water table during the test boring drilling indicates that dewatering should not be necessary during over excavation. However, groundwater may be perched on the denser soil requiring dewatering if the construction is done during the wet season or during

periods of heavy rain. As a minimum, the Contractor should be prepared to dewater the excavation during periods of wet weather.

For drilled shafts at the interior piers, temporary casing is required through the near surface loose granular deposits. Temporary casing and/or slurry may be needed below the specified limits to maintain sidewall stability and prevent bottom heave. Casing installation below the required elevations may be difficult due to dense soil conditions and cobbles. Although boulders were not encountered in the boring logs, the geologic regime indicates that boulders may be present and may be encountered in all excavation activities.

Available Geotechnical Reports

The following geotechnical report contains design and construction information relevant to the project and is available at the Project Engineers office and on-line at the WSDOT web site;

Allen, T/S. Tayeh, Attalia Vicinity Four Laning Bridge 12/606 Widening, Geotechnical Report December 15 2005

